

IN THE CLAIMS

The claims are amended as follows:

1. (currently amended) A diene polymer rubber composition comprising:

(A) 100 parts by weight of a raw material rubber comprising (A-1) a diene rubbery polymer which is a conjugated diene rubbery polymer or a conjugated diene-styrene rubbery copolymer, said diene rubbery polymer

(1) containing a modified component in an amount exceeding 60 wt.%, as determined by adsorption amount analysis with GPC, using a silica gel as a filler, which modified component is obtained by reacting an active end of the rubbery polymer with a polyfunctional compound having, in its molecule thereof, at least two epoxy groups,

(2) having a molecular weight distribution M_w/M_n of 1.05 to 3.0, or greater but less than 2.2, and having a weight-average molecular weight of 100,000 to 2,000,000; and, based on 100 parts by weight of the component (A),

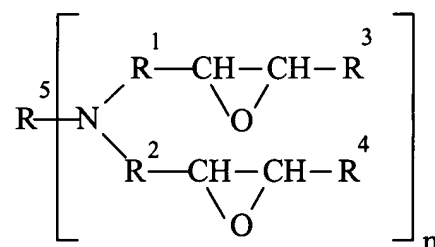
(B) 1 to 100 parts by weight of a rubber extension oil;

(C) 25 to 100 parts by weight of reinforcing silica; and

(D) 1.0 to 20 parts by weight in total of a vulcanizing agent and a vulcanizing accelerator.

2. (original): The diene polymer rubber composition according to claim 1, wherein the polyfunctional compound further has at least one nitrogen-containing group.

3. (original): The diene polymer rubber composition according to claim 1, wherein the polyfunctional compound is represented by the following formula:



wherein R¹ and R² each independently represents a C₁₋₁₀ hydrocarbon group or a C₁₋₁₀ hydrocarbon group having at least one group selected from ethers and tertiary amines, R³ and R⁴ each independently represents hydrogen, a C₁₋₂₀ hydrocarbon group or a C₁₋₂₀ hydrocarbon group having at least one group selected from ethers and tertiary amines, R⁵ represents a C₁₋₂₀ hydrocarbon group, a C₁₋₂₀ hydrocarbon group having at least one group selected from ethers, tertiary amines, epoxy, carbonyl and halogens, and n stands for 1 to 6.

4. (original): The diene polymer rubber composition according to claim 3, wherein the polyfunctional compound has, in its molecule thereof, at least one diglycidylamino group.

5. (original): The diene polymer rubber composition according to claim 1, wherein the content of the modified component of the component (A-1) has been analyzed by chromatography.

6. (original): The diene polymer rubber composition according to claim 1, further containing 0.1 to 20 wt.%, based on the weight of the component (C), of (E) an organosilane coupling agent.
7. (original): The diene polymer rubber composition according to claim 1, which further contains (F) 0.1 to 100 parts by weight of carbon black, the total amount of the components (C) and (F) being from 30 to 150 parts by weight.
8. (original): The diene polymer rubber composition according to claim 7, wherein the amount of the component (F) is 0.1 parts by weight or greater but less than 25 parts by weight.
9. (canceled):
10. (original): The diene polymer rubber composition according to claim 1, wherein the component (A) comprising 15 to 99 wt.% of the component (A-1) and 1 to 85 wt.% of component (A-2) which is a vulcanizable rubbery polymer other than the component (A-1).
11. (previously presented): A diene polymer rubber vulcanizate obtained by: conducting initial kneading, at least once under the conditions permitting kneading discharging temperature of 135 to 180°C, of an initial kneading component comprising:

(A) 100 parts by weight of a raw material rubber comprising (A-1) a diene rubbery polymer which is a conjugated diene rubbery polymer or a conjugated diene-styrene rubbery copolymer, said diene rubbery polymer

(1) containing a modified component in an amount exceeding 60 wt.%, which modified component is obtained by reacting an active end of the rubbery polymer with a polyfunctional compound having, in its molecule thereof, at least two epoxy groups,

(2) having a molecular weight distribution of M_w/M_n of 1.05 to 3.0, and

(3) having a weight-average molecular weight of 100,000 to

2,000,000; and, based on 100 parts by weight of the component (A),

(A) 1 to 100 parts by weight of a rubber extension oil; and

(B) 25 to 100 parts by weight of reinforcing silica, to thereby obtain an initial kneaded mass having a rubber bound content after kneading of 30 to 70 wt.%; adding, to 100 parts by weight of the component

(A), (D) 1.0 to 20 parts by weight in total of a vulcanizing agent and a vulcanizing accelerator; and kneading the resulting mixture to give a kneading discharging temperature of 120°C or less, thereby vulcanizing.

12. (original): The diene polymer rubber vulcanizate according to claim 11, wherein the initial kneading component further contains at least one of 0.1 to 20 wt.% of (E) an organosilane coupling agent based on the weight of the component (C) and 0.1 to 100 parts by weight of (F) carbon black based on 100 parts by weight of the component (A).

13. (original): The diene polymer rubber vulcanizate according to claim 11, wherein the component (A) comprises 15 to 99 wt.% of the component (A-1) and (A-2) 1 to 85 wt.% of a vulcanizable rubbery polymer other than the component (A-1)

14. (original): The diene polymer rubber vulcanizate according to claim 12, wherein the amount of the component (E) is 0.1 wt.% or greater but less than 6 wt.% based on the amount of the component (C).

15. (original): The diene polymer rubber vulcanizate according to claim 11, wherein initial kneading is carried out to give the below-described kneading discharging temperature (Td) depending on a heating loss (Mo) of the component (C).

$$1) \quad 135 \leq T_d \leq 180^{\circ}\text{C} \text{ when } 1\% \leq \text{Mo} \leq 4\%$$

$$2) \quad (15 \times \text{Mo} + 75)^{\circ}\text{C} < T_d \leq 180^{\circ}\text{C} \text{ when } 4\% < \text{Mo} \leq 6\% \text{ and}$$

$$3) \quad 165^{\circ}\text{C} < T_d \leq 180^{\circ}\text{C} \text{ when } 6\% < \text{Mo} \leq 10\%.$$

16. (withdrawn): A process for producing a rubbery polymer having a high modification ratio through reaction of a diene polymer having an active end and a modifier, comprising the steps of:

reacting impurities contained in a monomer and a solvent with an organic metal compound to inactivate the impurities;

feeding the monomer and solvent into a polymerization reactor;
and carrying out polymerization.

17. (withdrawn): The process according to claim 16 wherein an amount of all the impurities in the monomer and solvent to be fed to the polymerization reactor is reduced to less than 0.40 equivalent based on an initiator to be fed to the polymerization reactor, and the rubber polymer obtained contains a modified component in an amount exceeding 60 wt.%.

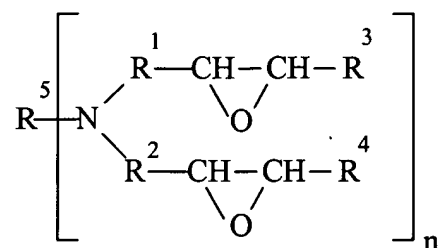
18. (withdrawn): The process according to claim 16, wherein the modifier is a polyfunctional compound having at least two epoxy groups in its molecule.

19. (withdrawn): The process according to claim 17, wherein the modifier is a polyfunctional compound having at least two epoxy groups in its molecule.

20. (withdrawn): The process according to claim 16, wherein the modifier is a polyfunctional compound having at least two epoxy groups and at least one nitrogen atom in its molecule.

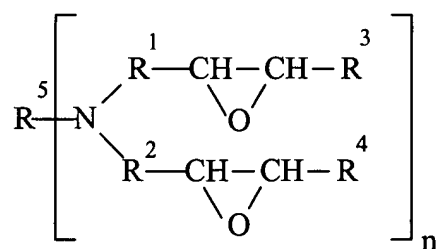
21. (withdrawn): The process according to claim 17, wherein the modifier is a polyfunctional compound having at least two epoxy groups and at least one nitrogen atom in its molecule.

22. (withdrawn): The process according to claim 16, wherein the modifier is represented by the following formula:



wherein, R¹ and R² each independently represents a C₁₋₁₀ hydrocarbon group or a C₁₋₁₀ hydrocarbon group having an ether or a tertiary amine, R³ and R⁴ each independently represents hydrogen, a C₁₋₂₀ hydrocarbon group or a C₁₋₂₀ hydrocarbon group having an ether or tertiary amine, R⁵ represents a C₁₋₁₂ hydrocarbon group or a C₁₋₁₂ hydrocarbon group having at least one group selected from ethers, tertiary amines, epoxy, carbonyl and halogens, and n stands for 1 to 6.

23. (withdrawn): The process according to claim 17, wherein the modifier is represented by the following formula:



wherein, R^1 and R^2 each independently represents a C_{1-10} hydrocarbon group or a C_{1-10} hydrocarbon group having an ether or a tertiary amine, R^3 and R^4 each independently represents hydrogen, a C_{1-20} hydrocarbon group or a C_{1-20} hydrocarbon group having an ether or tertiary amine, R^5 represents a C_{1-12} hydrocarbon group or a C_{1-12} hydrocarbon group having at least one group selected from ethers, tertiary amines, epoxy, carbonyl and halogens, and n stands for 1 to 6.

24. (previously presented): The diene polymer rubber composition according to claim 1 wherein the amount of the epoxy group of the polyfunctional group to be reacted with the active end of the polymer exceeds 0.6 equivalent and the ratio of the molecule of the polyfunctional compound to the active end of the polymer to be reacted therewith is not greater than 10 times the molar amount thereof.

25. (previously presented): The diene polymer rubber composition according to claim 1 wherein the number of the epoxy groups in the molecule is at least 4.

26. (previously presented): A diene polymer rubber composition comprising:

(A) 100 parts by weight of a raw material rubber comprising (A-1) a diene rubbery polymer which is a conjugated diene rubbery polymer or a conjugated diene styrene rubbery copolymer, said diene rubbery polymer

(1) containing a modified component in an amount exceeding 60 wt.%, which modified component is obtained by reacting an active end of the rubbery polymer with a polyfunctional compound having, in its molecule thereof, at least two epoxy groups, wherein the amount of the epoxy group of the polyfunctional compound to be reacted with

the active end of the rubbery polymer exceeds 1 equivalent and is not greater than 10 times by mole per mole of the active end, so that an unreacted epoxy group exists in the resulting polymer,

2) having a molecular weight distribution Mw/Mn of 1.05 to 3.0, and

(3) having a weight-average molecular weight of 100,000 to 2,000,000; and,

based on 100 parts by weight of the component (A),

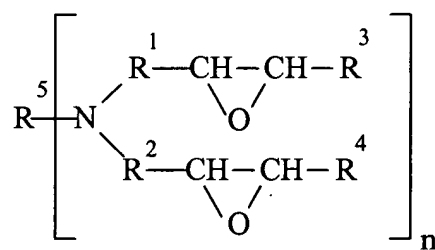
(B) 1 to 100 parts by weight of a rubber extension oil;

(C) 25 to 100 parts by weight of reinforcing silica; and

(D) 1.0 to 20 parts by weight in total of a vulcanizing agent and a vulcanizing accelerator.

27. (new): The diene polymer rubber composition according to claim 26, wherein the polyfunctional compound further has at least one nitrogen-containing group.

28. (new): The diene polymer rubber composition according to claim 26, wherein the polyfunctional compound is represented by the following formula:

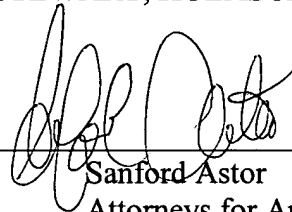


wherein R¹ and R² each independently represents a C₁₋₁₀ hydrocarbon group or a C₁₋₁₀ hydrocarbon group having at least one group selected from ethers and tertiary amines, R³ and R⁴ each independently represents hydrogen, a C₁₋₂₀ hydrocarbon group or a C₁₋₂₀ hydrocarbon group having at least one group selected from ethers and tertiary amines, R⁵ represents a C₁₋₂₀ hydrocarbon group, a C₁₋₂₀ hydrocarbon group having at least one group selected from ethers, tertiary amines, epoxy, carbonyl and halogens, and n stands for 1 to 6.

Respectfully submitted,

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By

A handwritten signature in black ink, appearing to read 'Sanford Astor', is written over a horizontal line.

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